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ABSTRACT

Intended to provide background information and preliminary policy options for the California Community Colleges' Commission on Innovation, this document explores the advantages and costs of shifting to year-round operations to increase college capacity and reduce the need for new facilities. Following introductory materials detailing the Commission's charge, projected increases in the statewide demand for college services through the year 2005 are reviewed, indicating that approximately $4 billion worth of construction will be needed to accommodate the growth. The current basis for planning and approving new facilities is also reviewed, defining terms and equations used in determining needs for new facilities. Next, options for using existing facilities more effectively are presented, including the implementation of year-round scheduling using quarters, trimesters, or multi-track calendars. This section indicates that a year-round schedule would increase potential capacity by 12% to 35%, saving from $1.5 billion to $2.5 billion in capital outlay expenditures. Other strategies described include adding instructional programs from 2:00 to 5:00 in the afternoon and developing master campus course schedules that are optimally convenient for the greatest possible number of students. A cost model for capital outlay expenditures with year-round operations, a list of Commission on Innovation Facilities Task Force members, and 24 references are appended. (KP)

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REDUCING THE NEED FOR NEW FACILITIES THROUGH FULLER USE OF EXISTING FACILITIES

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September 1992

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Note: This paper was prepared by the staff of the Commission on Innovation to stimulate discussion. For comments, contact Daniel Weiler, BW Associates, 815 Allston Way, Berkeley, CA, (510) 843-8574, fax (510) 843-2436.

ABSTRACT

California's community colleges are being asked to maintain their system of open access for all students at a time when funds have become increasingly tight and the state's population explosion is expected to bring some 600,000 new students to the colleges over the next 13 years. The Chancellor's Office estimates that more than four billion dollars worth of new facilities will have to be built by the year 2005 in order to accommodate this expected growth in student enrollment demand.

It will not be possible for the community colleges to fund the construction of over four billion dollars worth of facilities between 1992 and 2005. Unless the colleges take bold steps to accommodate the projected increase in student enrollment demand without having to resort to massive new capital outlay expenditures, hundreds of thousands of prospective new students—most of them ethnic or language minorities—will simply be shut out of higher education.

This Policy Discussion Paper explores the advantages and costs of shifting to year-round operations as a way of increasing college capacities and reducing the need for new facilities at existing campuses. The paper also discusses ways in which the colleges could make better use of afternoon hours for scheduling instructional programs, and use master course scheduling to make fuller use of existing facilities.

The paper suggests that by shifting to year-round operations, the colleges could accommodate most of the expected growth in student enrollment demand and save a significant fraction of the capital outlay expenditures that would otherwise be needed. Additional demand could be met if the colleges introduced self-contained afternoon instructional programs and master course scheduling. To encourage the shift to year-round operations and other practices designed to increase college capacities, the Chancellor's Office might employ tighter criteria for approving district proposals to build new facilities on existing college campuses. The new criteria would require colleges to expand their capacities through year-round operations, self-contained afternoon instructional programs, and master course scheduling before proposing new facilities construction.

A shift to year-round operations would undoubtedly require major adjustments in thinking and the disruption of established work patterns. In flush times, these discomforts might not be necessary; in today's economic climate they are probably the price that will have to be paid for maintaining an open access community college system in California.

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PREFACE

California's community colleges are facing a period of unprecedented growth in the number and diversity of students who will seek an education before the turn of the century. More students, especially from minority and poor backgrounds, will want to enter community colleges as their best—and often only—gateway to the higher levels of education necessary for success in an increasingly technological and competitive world. Yet the dual pressures of growth and limited budgets could reduce access precisely for those students for whom community colleges have traditionally been the principal avenue for equal educational opportunity.

Despite these pressures, the California Community Colleges are committed to insuring access for all students, and, in particular, to increasing the retention, completion, and transfer rates of ethnic minority and low-income students. To do so, the colleges realize they must introduce far-reaching changes in instructional programs, management strategies, relations with other sectors of society, and the use of facilities and resources.

The Commission on Innovation was formed by the California Community College Board of Governors in November, 1991 to address these concerns. With the colleges facing continuing budget pressures combined with unprecedented growth in student numbers and diversity, the Board realized that "business as usual" would no longer be possible, and asked the Commission to identify innovative ways in which the community colleges could respond to these challenges. The Commission was asked to write a report that proposes policies which build on the colleges' proven record of excellence in order to achieve higher quality, more cost-effective instruction and management for an era of growth and diversity marked by limited budgets.

As an aid to the Commission in its deliberations, the Chancellor has asked the Commission staff to prepare a series of Policy Discussion Papers that provide background information and *preliminary* policy options for Commission consideration. These staff papers are intended specifically to stimulate discussion from which the Commission

can give direction to the staff to further the research and policy analysis process. All the papers will be widely circulated in order to facilitate discussion among community college professionals and feedback from the field. The papers are based on reviews of relevant literature and discussions with community college professionals and national experts, and will address nine crucial areas the Chancellor has asked the Commission and the three **Challenge XXI** Task Forces on Management, Instruction, and Facilities to consider:

1. How could facilities be more efficiently used and planned in order to accommodate growth and save money?

2. How could the colleges use technology in order to enhance learning, improve management, and increase cost-effectiveness?

3. How could partnerships between the community colleges and business be better utilized and further developed to help enhance community college growth and diversity, deal with college resource limitations, and address issues of economic development?

4. How could the community colleges work cooperatively with other education segments in order to accommodate growth and increase cost-effectiveness?

5. How could the colleges achieve continuous improvement in the quality and efficiency of their management and their services to a diverse clientele?

6. How could the community colleges become more effective learning environments for an increasingly diverse population, and in particular assure that underserved students receive the academic preparation required to prepare them for transfer?

7. What changes in system-wide and local college governance could enhance the colleges' efficiency and effectiveness?

8. How could additional revenue (from existing and/or new sources) be raised in order to help accommodate future growth?

9. What additional steps should the system take to ensure accountability for efficiency and effectiveness?

The Chancellor has made it clear that the answers to these questions must all address a common underlying theme: how the California Community Colleges can ensure access for all students, and increase the retention, completion, and transfer rates of ethnic minority and low-income students.

This Policy Discussion Paper addresses one of the keys to the colleges' abilities to accommodate student enrollment growth: how the colleges can make fuller use of current facilities and thereby reduce the need for new construction (see Question #1 above). The paper suggests steps the colleges could take in this direction and discusses policy options relevant to this question. Policy Discussion Paper #2 in this series discusses joint use strategies and other cooperative arrangements for utilizing existing facilities and cutting the cost of building new facilities, and Policy Discussion Paper #3 discusses ways in which the state-level process for approving new facilities could be streamlined. Policy Discussion Paper #5 discusses how statewide distance education could also help reduce the need for new facilities.

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Mike Anker, Faculty, Contra Costa College

Pamila Fisher, Chancellor, Yosemite Community College District

Dale Fleming, Trustee, College of Marin, and President, Fleming Associates

Nancy Glock, Specialist, Educational Standards and Evaluation Unit, Academic Affairs Division, Chancellor's Office, California Community Colleges

Curt Groninga, Dean, Administration Services, Santa Rosa Junior College

Don Haas, Manager, Facilities Planning, Los Rios Community College District

Mike Hargett, Vice President, Business Services, Cuesta College

Dave Houtrouw, Facilities Planning Specialist, Contra Costa Community College District

Frank Jewett, Director, Planning for Growth, California State University

Janis Cox Jones, Director of Planning and Policy Research, Los Rios Community College District

Clarence Mangham, Dean, Facilities Planning and Utilization Unit, Fiscal Policy Division, Chancellor's Office, California Community Colleges

Charles McIntyre, Director, Research and Analysis Unit, Policy Analysis Division, Chancellor's Office, California Community Colleges

Grace Mitchell, President, Cuesta College

William L. Storey, Assistant Director, Planning and Resource Management, California Postsecondary Education Commission

Dianne Van Hook, Superintendent/President, Santa Clarita Community College District

Robert Wiseman, Faculty, Chabot College

Discussions at meetings of the **Challenge XXI** Facilities Task Force also contributed valuable insights and helped to clarify many key details. The membership of the Task Force is shown in Appendix B.

While all of the individuals listed above provided valuable assistance, the views expressed in this Policy Discussion Paper are entirely those of BW Associates.

A. INTRODUCTION

California's 107 community colleges now serve approximately 1.5 million students. The Chancellor's Office (COCCC) has projected increased demand for community college services that could add some 600,000 additional students by 2005—to a total of more than two million—and has estimated that $4.2 billion dollars worth of new facilities would have to be constructed between 1992 and 2005 in order to accommodate this increase in demand.[1] COCCC estimates that approximately three-fourths (about 450,000) of the new students would seek to attend existing college campuses, which from 1992 - 2005 would have to add $3 billion worth of new and remodeled facilities in order to absorb them. An additional 150,000 students would have to be accommodated in 14 new campuses and 23 new centers constructed to ease congestion at some existing sites or serve growing populations in areas that are beyond convenient commuting distances to any existing college campuses. The cost of these new centers and campuses between 1992 and 2005 would be approximately $1.2 billion.[2]

The COCCC estimate of new facilities that will be required by 2005 may actually underestimate future needs:

1. The COCCC estimate was made prior to recent student fee increases and funding cutbacks at CSU and UC, and was therefore unable to predict the

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[1]California Community Colleges, 1991b. This estimate includes at least $500 million for renovation and remodeling. In addition to these capital outlay needs, the COCCC projects the need for $1.8 billion for maintenance and repairs between 1992 and 2005 (CPEC, 1992b). Maintenance funds come from the colleges' total yearly allocations for operational expenses; capital outlay funds come from bond revenues.

[2]California Postsecondary Education Commission, 1992b; California Community Colleges, 1991a. The plan calls for converting six existing centers to full campuses and constructing eight new campuses and 23 new centers. A center is defined by COCCC and CPEC as an off-campus site that is expected to enroll at least 500 full-time-equivalent students (FTES) by its third year of operation, and offers programs leading to degrees or certificates conferred by its parent institution. All other off-campus operations are considered to be outreach locations, usually serving relatively small numbers of students at community-based sites. A campus is a new location that may start as a center but ultimately becomes a site with sufficient acreage and facilities to provide a full range of instructional and student services. It may be administered as part of an existing college or may be a separately accredited, degree and certificate granting college (California Community Colleges, 1991b; CPEC, 1992a).

increase in community college enrollment demand that has begun to be felt from students who would otherwise have attended UC or CSU but who cannot find the classes they need or cannot afford the student fees at those institutions.

2. The COCCC estimate is based on a forecast of the number of hours that classrooms, laboratories, and other facilities are expected to be in demand. The basis for this forecast is a projection of total weekly student contact hours, or WSCH—the number of hours per week students will be in "contact" with instructors. Thus, students attending college on a full time basis are assumed to place twice as much demand on college facilities as students attending only half time. Most community college students attend school part time, carrying less than a full course load. The COCCC estimate of new facilities needs assumes that, on average, students attending the community colleges over the next 13 years will carry about the same course load that students have carried in recent years (i.e., their demand on facilities will be about the same). However, the number of high school graduates is expected to grow rapidly in the years ahead and, as discussed above, the community colleges are enrolling increasing numbers of students who would otherwise have attended UC or CSU. High school graduates who go directly to community colleges and "displaced" students from senior institutions tend to carry full course loads. If the general mix of community college students begins to include relatively more full-time students, WSCH will rise and there will be more pressure on facilities from a given headcount enrollment.[3]

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[3]WSCH varies widely by district, depending on the characteristics of different student populations. By knowing the historical relationship in each district between headcount and WSCH, planners can use enrollment forecasts to estimate future WSCH and, consequently, future facilities needs. According to a study conducted for the COCCC in 1990, the systemwide average WSCH in that year was 7.73 per headcount enrollment (meaning that the average student used classroom, laboratory and/or physical education facilities for 7.73 hours each week) (MGT, 1990b).

3. The COCCC estimate is based in large part on Department of Finance (DOF) enrollment projections. These projections assume that Black and Hispanic participation rates (the proportion of the population that attends community colleges) will remain unchanged; these rates have historically been lower than the participation rates of Asians and Whites.[4] The community colleges and other agencies are pursuing policies designed to ensure equal access to postsecondary education for all ethnic groups; if these policies succeed, and Black and Hispanic participation rates come to resemble those of other ethnic groups, total demand for community college services will exceed the COCCC estimate.

4. Historically, hard economic times have led to increased community college enrollments, as unemployed and under-employed citizens seek to improve their skills or acquire the training they need in order to compete successfully in the job market (or change occupations). A number of analysts believe that structural problems in California's economy militate against a strong recovery in the near term from the current recession, and that, in any case, unemployment and under-employment among historically disadvantaged groups is likely to remain high. Moreover, new job skill demands in an increasingly complex and technological workplace are likely to place growing pressure on workers to continually upgrade their skills. If these predictions are correct, future community college participation rates may well be higher than the 1980s rates used by DOF to project future enrollments, and the COCCC estimate may consequently understate future enrollment demand and the need for new facilities.

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[4]According to DOF figures, the 1988 Black participation rate was 7.7 percent; the rates for Hispanics was 6.3 percent; for Whites, 8.6 percent, and for Asians/Others 11.9 percent (CPEC, 1990a).

Student fee increases recently approved by the legislature and governor are expected to reduce the demand for community college services, though the long-run impact of these increases will not be known for some time. On balance, however, the COCCC estimate of the pressure on community college facilities from future enrollment demand is probably conservative—if anything, demand is likely to be greater than current plans assume.

It will not be possible for the community colleges to fund the construction of over four billion dollars worth of facilities between 1992 and 2005. A sum this large—an average of more than $300 million per year for 13 years—would exceed 15 percent of the maximum amount of bonds the state could market each year.[5] How then can the community colleges find the facilities they would ordinarily need in order to accommodate projected enrollment increases? There are three possible solutions: (1) reduce the need for new facilities by greatly increase the number of students who are served through distance education techniques, (2) plan and use new facilities more efficiently; and (3) use existing facilities more fully. The first approach is discussed in Policy Discussion Paper #5, *The Feasibility of Statewide Distance Education*. Approaches to the more efficient planning and use of new facilities are addressed by Policy Discussion Paper #2, *Cutting the Cost of New Community College Facilities: Joint Use Strategies*, and Policy Discussion Paper #3, *Cutting the Cost of New Community College Facilities: Streamlining the Facilities Approval Process*. Strategies for making fuller use of existing facilities are taken up below.

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[5]In 1988, the three higher education segments together shared just 11 percent of all bonds financed. Most community college capital outlay funding is currently supported by general obligation bonds, which must be approved by the voters. Debt service on these bonds is paid from state General Fund revenues prior to calculation of the community colleges' Proposition 98 apportionments. Some capital outlay needs are also funded through revenue bonds, which can be approved by the legislature. Revenue bonds are repaid from the community colleges' general apportionment, which reduces the money available to support operational funding needs. The COCCC estimates that the repayment of every $200 million in revenue bonds will require about one percent of future apportionments. Before the state's recent financial troubles, the State Treasurer's Office estimated that California could market about $2 billion in bonds each year (California Community Colleges, 1991b).

This Policy Discussion Paper reviews the current basis for planning and approving new facilities, discusses ways in which existing facilities could be used more fully before new construction is authorized, and explores policies that could support substantial savings in capital outlay expenditures. The paper adopts the premise that current operational costs for new students will be met, and concentrates on ways to cut the cost of facilities that would be needed to accommodate these students. This premise is, to be sure, open to challenge, since it would require well over one billion additional 1992 dollars in current operational funding (at today's rate of spending per FTES) to support the enrollment of an additional 600,000 students. Through a combination of improvements in efficiency and new revenue raising approaches, the community colleges may find ways to meet the needs of these additional students; other papers in this series discuss these issues. Whatever steps are taken, the colleges will have to solve the problem of providing adequate facilities, since capital outlay expenditures only increase the overall state financial burden and currently projected capital construction needs cannot be met. This paper therefore focuses on this issue.

B. THE BASIS FOR APPROVING NEW FACILITIES

Approving New Facilities at Existing Campuses

Community college districts are authorized to propose the construction of new facilities at existing college campuses when they can show that projected enrollments will exceed the capacity of a college's classrooms, teaching laboratories, and other facilities. Clearly, COCCC and state agency judgments regarding the need for new facilities on existing campuses rest heavily on how "capacity" is defined. Currently, that definition is tied to state standards for facilities utilization at the community colleges,[6] and to state regulations that stipulate the minimum number of instructional days per year that colleges must offer.

The facilities utilization standards for classrooms and teaching laboratories have three components:

a) The state *classroom space* standard is 15 assignable square feet (ASF) per student station; this yields the number of students seats each classroom should make available.[7] (The *teaching laboratory space* standard varies widely by discipline.)

b) The standard for *classroom utilization* assumes that community colleges schedule classes for 70 hours per week (8:00 a.m. - 10:00 p.m., Monday through Friday). Colleges with 140,000 or more weekly student contact hours (approximately 9,000 FTE) are expected to have a weekly room hour (WRH) utilization of 53 hours (i.e., to have classrooms in use 76 percent of the time). For smaller colleges, the standard is 48 hours, or 69 percent utilization. The *teaching laboratory utilization* standard is 27.5 hours per week (39 percent). These standards do not vary by

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[6]See California Code of Regulations, Title 5, Sections 57020-57028.

[7]Local fire marshals often press the districts to adhere to a 20 square foot standard, particularly for smaller classrooms with fewer exits.

time of day; they are expressed as a proportion of all classroom or teaching laboratory hours available in a week. There are no variations in the standards according to college urban/suburban/rural locations or other local considerations.

c) The *classroom station occupancy percentage* (SOP) standard is 66 percent (i.e., an expectation that 66 percent of a classroom's available seats should be filled when the classroom is in use). The *teaching laboratory occupancy percentage* standard is 85 percent.

The product of the weekly room hour utilization and station occupancy standards is defined as *weekly station hour utilization*. For classrooms, for example, the weekly station hour utilization standard is 53 hours x .66 station occupancy = 35 weekly station hours.[8]

The three components of the facility utilization standard are translated into a formula that defines how many assignable square feet of space colleges are assumed to need for every student's weekly use of facilities (i.e., for every weekly student contact hour). Looking again just at classrooms, the formula is:

$$\frac{\text{15 ASF/Student Station}}{\text{35 Weekly Station Hours}} = .43 \text{ ASF per WSCH}$$

[8]The standards described above were originally developed in the mid-1960s by the Coordinating Council for Higher Education (the predecessor agency to the Postsecondary Education Commission), based on segment utilization studies and advice from education planners. The standards were identical to those in use today, but the school day was assumed to extend only to 5:00 p.m. In 1970, the legislature extended the nominal school day to 10:00 p.m., which lengthened the school week to 70 hours. Because the WRH and SOP standards remained the same, theoretical capacity was increased by 56 percent (from a weekly station hour standard of 22.4 hours to 35 hours). CPEC (1990a) recently proposed to increase the classroom space standard from 15 to 16.5 ASF, and to relax the station hour utilization standard from 35 to 30 weekly station hours (this change would be accomplished by lowering the classroom utilization standard from 53 to 42 weekly room hours, and raising the station occupancy standard from 66 percent to 71.4 percent). CPEC's proposals were based on studies that surveyed space and utilization standards in other states and reviewed facilities utilization in California (MGT Consultants, 1990a, 1990b). The Legislative Analyst's Office largely supported CPEC's recommendations to increase the classroom space standard, but argued that CPEC had not made an adequate case for changing the classroom utilization standard (Legislative Analyst's Office, 1990a). The community colleges provide COCCC with space inventories that list the amount and kinds of space available on their campuses, but they do not conduct studies of how that space is actually utilized. Thus, no data are available from the community colleges to support an empirical assessment of current state standards.

The definition of community college "capacity" rests on two assumptions: (1) Capacity will be exceeded when, after applying the above facility utilization standards, a college cannot accommodate any additional WSCH, and (2) capacity is limited by the number of WSCH a college can accommodate over the course of a 35 week instructional year.[9] Colleges whose WSCH exceed or are projected to exceed campus capacity may propose to build new facilities on their campuses and can reasonably expect to have their proposals approved by COCCC and state agencies (though the timing of new construction projects depends on the availability of state capital outlay funds). Using the standards described above, for example, a college would need 34,400 assignable square feet of classroom space in order to meet a workload of 80,000 weekly student contact hours (approximately 10,000 students).[10] If the college had 24,400 ASF of classroom space and it estimated on the basis of demographic projections that it would have an 80,000 WSCH workload within a few years, it could propose to add another 10,000 ASF of classroom space to its existing facilities.

Based on district inventories of available ASF, the COCCC has compared the current WSCH capacity of each district (defined as described above) to future WSCH demand as forecast by DOF enrollment projections. This comparison has yielded an estimate of the systemwide need for additional facilities at existing campuses through 2005-06.

Approving New Campuses and Centers

Community college districts are authorized to propose the construction of new campuses or centers when they can show that enrollment demand will grow in areas of

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[9]State regulations stipulate that the colleges must offer 175 days (35 five-day weeks) of instruction. The 175 days must include at least 160 actual teaching days (including up to 10 days for examinations); the remaining time may be used as "flex" days, when no classes are held (the time must be used for planning, professional development, or related activities). With the exception of the usual summer school classes, no community colleges exceed this 35 week instructional period. Less than ten percent of systemwide FTES is accounted for by summer classes (Cook, 1992).

[10]80,000 WSCH x .43 ASF per WSCH = 34,400 ASF. 80,000 WSCH/7.73 WSCH per headcount = 10,349 students.

their district that are beyond convenient commuting range to an existing campus, or when projected district enrollments will exceed the planned capacity of existing colleges and centers. The COCCC estimate of new campuses and centers that will be needed by 2005 is based on a district-by-district needs analysis in light of broad COCCC planning guidelines.[11] In practice, new sites are authorized only after an exhaustive assessment—by COCCC, CPEC, and other state agencies—of district educational master plans, environmental impact reports, special enrollment projections, needs studies, and other documentation, and then only after districts have addressed a number of alternatives to new sites. These alternatives include expansion or increased utilization of their existing campuses, sharing facilities with other higher education segments, and using distance education to meet new demand.[12] Most new sites are approved in order to serve new population centers that are too far from an existing campus. Because new population centers will need new sites regardless of how fully existing sites are used,[13] this paper focuses on ways in which to reduce the need for new facilities at *existing* college campuses.

The next section of this paper discusses the single most important step the community colleges can take to expand the use of their facilities: shifting to year-round operations.

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[11]The planning guidelines specify that a new campus (or a new center that may become a campus) will be proposed when (1) the service area for an existing campus exceeds 100 square miles for urban campuses, 500 square miles for suburban campuses, or 1,000 square miles for rural campuses and/or (2) the average enrollment density at a district's college campuses exceeds 750 WSCH per acre. The first guideline was devised to meet a CPEC requirement that automobile commuting time to a campus should not exceed 30-45 minutes (including time to park). The second guideline was established by the COCCC as a rough rule of thumb to support an estimate of future needs (California Community Colleges, 1991a). The 750 WSCH per acre standard has been criticized by the Legislative Analyst's Office as inappropriate in light of the fact that many campuses currently support much higher enrollment densities (Legislative Analyst's Office, 1990b). An independent study conducted for the COCCC found that WSCH per acre in three other Western states ranged from 800 to over 1,000, and concluded on the basis of a separate analysis that 750 WSCH per acre was a reasonable planning guideline (MGT, 1990c). COCCC data show that the range in California in 1990 was 49 - 7,680 WSCH/acre (California Community Colleges, 1991a, Appendix A).

[12]California Postsecondary Education Commission, 1992b.

[13]Unless new populations can be served through distance education techniques—see Policy Discussion Paper #5.

Section D considers several additional strategies for using facilities more fully, and Section E discusses policy options for achieving this objective.

C. SHIFTING TO YEAR-ROUND OPERATIONS

Approximately 90 percent of community college FTES are taught over a 35 week period that begins sometime in late August or early September and lasts through May or early June. Thus, with the exception of summer school classes, community college facilities are utilized an average of only two-thirds of the year. By shifting to year-round operations (YRO), the community colleges could accommodate a substantial fraction of the approximately 450,000 new students who are expected to seek admission to an existing college or center.

How Year-Round Programs Might Work

Quarter systems. Most higher education institutions that have moved to year-round schedules have done so with quarter systems, which divide the academic year into four equal lengths of 11-12 weeks each. Each of the four quarters provides the same amount of instructional time and curriculum coverage that students now get in any of the three quarters at a quarter system college that is not on a year-round schedule. Students attend any three of the four quarters, or can accelerate their studies by attending year round.[14]

Trimesters. Trimester plans are a less common approach to year-round operation. In these plans, each trimester is 15 or 16 weeks in length (compared to a 17.5 week semester). Because there are fewer weeks of instruction in each of the trimesters than in the traditional semester, community college faculty and administrators have to be satisfied that a semester's course material can be covered with fewer days of instruction. Alternatively, each class period can be lengthened slightly, so that total instructional time

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[14]Year-round attendance would enable students to complete their educations and enter the world of work sooner than they otherwise could, but would limit access for new students, since facilities that would otherwise be available to accept new enrollees would be occupied by continuing students. The faster "throughput" from year-round attendance would only reduce the delay before college entry for students on waiting lists.

in each trimester is equal to that in a traditional semester.[15] Students attend two of the three trimesters, though as with quarter systems, students wishing to accelerate their academic schedules can attend for the full year.

Multi-track calendars. Multi-track year-round programs divide the instructional calendar into several sessions with multi-track calendars that rotate students throughout the year on differing schedules.[16] Schedules are arranged so that the facilities are always in use (except for common vacation periods) and more students can be accommodated because there is never a time when all student tracks are in session simultaneously. For example, a college might divide the academic year into four nine-week instructional blocks (four blocks of 45 instructional days each, or 180 days), with three intersessions of three weeks each; seven additional weeks would be available during the year for campus maintenance, planning, and vacation. Four separate groups of students would attend all four sessions, with three groups in session at any given time. Or the instructional year could be divided into three twelve-week blocks with three-week intersessions; all students would share a common summer break of four weeks, plus three weeks of vacation during the academic year. Five separate groups of students could be accommodated, with four groups of students in session at the same time.

Any of these year-round plans would make it possible to accommodate substantially more students in existing facilities. At the same time, shifting to YRO would require colleges to re-configure their curricula, restructure their course offerings, develop and disseminate new course descriptions and schedules, and plan new schedules for building

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[15]The Chabot-Las Positas district, for example, has been studying ways to experiment with a trimester academic year. District analysts believe that the minimum state requirement of at least 80 instructional days per semester cannot be met on a three-semester schedule, given legal holidays and other necessary breaks. They are exploring whether it would be possible to meet the state requirement (state regulations would have to be modified) through a slight increase in the length of each class period; these increases would allow the district to provide the same total instructional time that would be available in three 80+ day semesters with current class period lengths (Wiseman, 1992).

[16]Almost one-fourth of all K-12 students in California are in multi-track year-round schools (Gandara, 1992).

maintenance and for registration, counseling, and related functions. This would represent a substantial one-time conversion effort.

Of the three approaches to YRO described above, a trimester system would be most compatible with the current organization of the academic year at most community colleges (101 out of 107 colleges are on the semester system; two of the remaining six colleges on the quarter system are planning to switch to a semester system by 1994). It would probably incur the least transition effort systemwide, and articulation agreements with the senior segments could probably be most easily reaffirmed. Since most community colleges are now on the semester plan, conversion to a quarter system would take more time and effort than conversion to a trimester schedule, and conversion to a multi-track calendar would require the greatest effort. The latter systems are more complex than either quarter or trimester systems and are least familiar to community college faculty and administrators.

Though it would seem that, due to the relative ease of conversion, trimester systems might be the most desirable approach to year-round operations—followed by quarter systems—other factors suggest that multi-track calendars deserve serious consideration. One of the problems with both the quarter and trimester approaches is that the third trimester or fourth quarter are generally treated as the "summer addition." Thus, students are encouraged to continue regarding the non-summer terms as the "real" school year—and to continue treating the summer months as the only desirable time for a break from classes. Multi-track calendars may build in a common summer break, but they distribute enrollment equally throughout the academic year, providing that each grouping ("track") is of comparable size (which is easy to ensure). Since cost savings from YRO are greatest when there is a reasonably equal distribution of students across

the academic year, multi-track calendars, rather than trimester or quarter systems, may well be the most efficient year-round plans.[17]

Multi-track plans distribute enrollment equally throughout the year because the different student tracks attend on staggered schedules. This characteristic of multi-track plans also has distinct educational advantages. As many high schools that have shifted to year-round schooling have learned, shorter absences from school reduce the amount of learning that is lost when students are away for an entire summer. (For students who do not attend year round, the trimester system, and to a lesser extent the quarter system, would not have this advantage. A trimester system leaves about four months between terms; a quarter system about three months.) Evidence from the K-12 sector also suggests that breaks distributed over the year reduce teacher burnout.[18] Moreover, the intersession periods in a multi-track calendar could be used by the colleges to provide additional assistance to students with academic problems, through intensive lab work or tutoring (decoupled from the pressure of course schedules and exams). The colleges could also use these periods to focus on career and transfer information, with the cooperation of local businesses, professions, and senior institutions. Or, the time between academic sessions could be used by students for work internships and apprenticeships that would allow them to combine work experience and academic studies without losing time toward completing their degrees or certificates or qualifying for transfer to senior institutions.[19] Multi-track calendars would also enable students to schedule blocks of temporary employment at different times during the year, rather than having to compete with all other students for summer jobs.

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[17]After reviewing some 14 studies of year-round operations in postsecondary institutions, CPEC recently concluded that year-round operations could lead to substantial capital outlay savings provided summer term enrollments equalled those in other terms during the year (CPEC, 1990b). A cost disadvantage of lower enrollments in the summer term is the relatively high operational cost per student associated with smaller class sizes.

[18]Gandara, 1992.

[19]Cooperative education programs currently allow students to obtain academic credit (up to 24 units) for work experience, but most students work part-time and take longer to graduate.

This preliminary analysis suggests that on balance, the multi-track calendar might be the most cost-effective approach to year-round education, notwithstanding its somewhat greater initial expense for planning and conversion.

Capital Outlay Expenditures With Year-Round Operations

We conducted an exploratory analysis of the potential impact on capital outlay expenditures of a shift to year-round operations. In order to obtain a preliminary estimate of the number of new students who could potentially be served at existing campuses through YRO, and the capital outlay costs that might be anticipated with year-round operations, we assumed that colleges would shift from a semester system to a trimester system. The following analysis is restricted to capital outlay costs that might be incurred at existing campuses and centers; Appendix A contains our costing assumptions and additional details.

In theory, shifting from a two-semester to a trimester year could increase the potential capacity of existing colleges and centers by 50 percent. However, about 10 percent of systemwide FTES attend summer classes; thus the *net* increase in potential capacity would drop to 35 percent.[20] In reality, we believe that the true net increase in capacity is likely to be lower, for several reasons:

- the greatest increase in potential capacity due to YRO occurs when all terms have approximately equal WSCH (e.g., both enrollment and student course loads are about the same during a "summer" term as they are during other terms), and this may be difficult to achieve;

[20]By adding an "identical" semester to the existing fall and spring semesters, the new capacity goes to 150 percent of current fall and spring capacity. Current fall and spring capacity is 90 percent of total annual capacity (i.e., excluding 10 percent for summer school). Thus, the net capacity increase will be .9 x 1.5 = 1.35.

- summer school attendance varies by district; the true "net" increase in capacity would depend on how many WSCH were already being served in the summer period by districts with high demand;[21] and

- normal operational constraints would probably make it difficult for a college to take maximum advantage of a potential increase in capacity.[22]

Moreover, some districts will have substantially higher demand than the systemwide average. These districts, even after shifting to YRO, will not be able to accommodate all students who would like to enroll, and will need additional facilities in order to serve this "unmet" demand.

We explored the impact on capital outlay costs at existing campuses of different assumptions about increases in the capacity of each district due to YRO, and the impact of those increases on unmet demand at each district. In order to conduct this exploration, we examined WSCH projections to 2004-05 for each of the 71 districts and tested a range of scenarios for each district, from an "ideal" capacity increase of 35 percent to an increase of only 12 percent.[23] We also introduced one further variation: We asked what the system-level capital outlay costs for YRO might be if all unmet demand were

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[21]District-level data on WSCH in summer sessions were not available from COCCC.

[22]For example, trimester systems that increase class length in order to maintain the same amount of total instructional time per term as semesters now provide would be able to hold fewer classes during an instructional week. A five minute increase in the length of each class period comes to a total of about 60 minutes (one full class period less) over the course of a day (say, from 12 classes to 11 classes). Though the increase in class length appears to provide the same number of contact hours as a semester would, this is deceptive: By giving one less class per day, daily capacity is being reduced by one-twelfth (eight percent) for each term, compared to what might be available if each trimester term were equivalent to one semester. This would be a problem only if the trimester college already used all available instructional hours in a day and could not adjust its program by adding one additional course (e.g., during the afternoon).

[23]Data on current district capacities were not available from COCCC. The scenarios assume that all districts are at capacity in 1992-93; if any of the "high demand" districts have excess capacity in 1992-93 and beyond, they would be able to absorb some of the unmet demand, and capital outlay costs would be lower. These scenarios should therefore be reasonably conservative.

accommodated by building new facilities at existing districts; and we asked how this outcome might change if unmet demand were accommodated at *new* colleges and centers up to the point where 25 percent of all expected WSCH growth between 1992 and 2005 was absorbed.[24] Figure 1 illustrates the results of this analysis for the system as whole. The figure shows that in the "ideal" case—a 35 percent increase in potential capacity, with unmet demand served by new colleges and centers—there might be no need for new facilities at existing campuses. If the unmet demand were accommodated at existing campuses in this scenario, new facilities needed by those campuses might still cost only about $500 million—some $2.5 billion less than the $3 billion currently projected by the COCCC.

The most conservative scenario—that increased district capacity would be no greater than 12 percent—shows facility costs at existing campuses of some $1.5 billion if unmet demand were accommodated at new colleges and centers (until 25 percent of the total growth in WSCH is reached). If existing campuses built facilities to absorb the unmet demand, the systemwide cost of new facilities might rise to about $2.5 billion.

This exploratory analysis suggests that substantial capital outlay savings could be achieved under a wide variety of assumptions about the potential efficacy of shifting to year-round operations. If YRO were able to increase potential WSCH capacity system-wide by as much as 20 percent—a not unreasonable expectation—the cost of new facilities might range from about $500 million to about $1.5 billion, which would be, respectively, some $2.5 billion to $1.5 billion less than current COCCC estimates for existing campuses.

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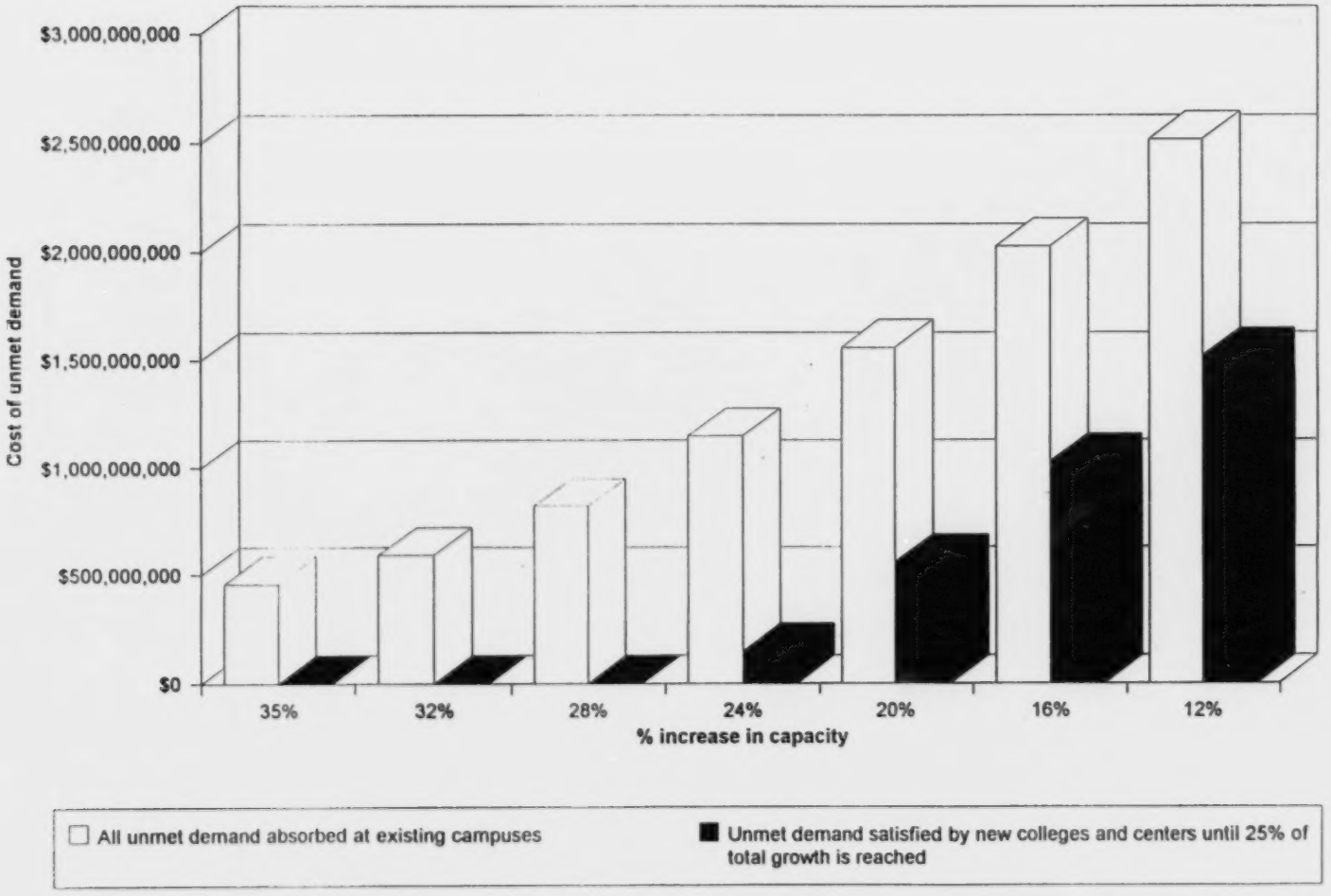
[24]DOF projections of WSCH extend to 2000-01; an extrapolation to 2005 shows a total increase of 4.3 million WSCH between 1992 and that date. COCCC staff estimate that three-fourths of this growth—3.2 million WSCH—would have to be accommodated at existing campuses; the remaining 1.1 million WSCH are expected to attend new colleges and centers.

Figure 1

System-Level Capital Outlay Expenditures with Year-Round Operations



Actual capital outlay costs would exceed the expenditures shown in Figure 1, since some capital expenditures would have to be devoted to the repair and renovation of existing plant, architectural barrier removal, and the expansion of libraries, office space and other facilities that may be needed to support higher enrollments. A more accurate estimate could be derived from a detailed study of the facilities construction requirements projected by the COCCC for each of the 71 districts. Such a study would take into account the wide range of purposes for which facilities construction dollars would be spent at each district; would account for construction monies already committed and in the "pipeline" that are part of the 13-year spending totals discussed above;[25] and would calculate total cost savings by analyzing the actual projected spending for each year and estimating the cumulative and aggregate bond retirement costs associated with these spending plans.[26] An analysis of this magnitude was beyond the scope of this paper, and the data required for such an analysis are not readily available at the COCCC. Nevertheless, our preliminary investigation indicates that a shift to year-round operations could go far toward resolving the need for new facilities faced by the community colleges.

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[25]The COCCC currently is currently preparing to spend $280 million of capital outlay funds; this sum is the total available to date out of $1.525 billion worth of proposed capital outlay expenditures identified in the COCCC *1992-93 Five Year Capital Outlay Plan* for the period 1992-93 through 1994-95.

[26]CPEC cites an analysis by the California State Treasurer showing that the cost of $100 million in general obligation bonds amortized over 20 years at six percent interest would be $163 million (revenue bonds carry higher interests rates; the comparable analysis for $100 million worth of revenue bonds shows a 20-year cost of $181.5 million at an interest rate of 6.5 percent). A more detailed analysis of projected capital outlay savings that YRO might make possible would have to account for these bond retirement costs (CPEC, 1992a).

D. OTHER STRATEGIES FOR MAKING FULLER USE OF FACILITIES

Self-Contained Afternoon Instructional Programs

As discussed above, the current state standard for community college utilization of classroom facilities is 35 weekly station hours, which assumes 66 percent classroom occupancy and 53 hours per week—10.6 hours per day—of classroom utilization. Colleges can meet the classroom utilization standard by holding classes from 8:00 a.m. to 2:00 p.m. and from 5:00 p.m. to 10:00 p.m.—a total of 11 hours. Most colleges have fully subscribed evening programs, and many colleges exceed the state standard without holding afternoon classes, because they start classes at 7:00 a.m. and/or hold classes on Saturdays.

The three-hour block of time between 2:00 p.m. and 5:00 p.m. represents an opportunity to expand the use of college facilities in order to accommodate more students. Do colleges use this time to hold classes? As we have noted earlier in this Policy Discussion Paper, the community colleges do not measure facility utilization, so no systemwide data are available on afternoon course scheduling. The 1990 CPEC study of space and utilization standards relies heavily on data from the California State University, but CPEC maintains on the basis of focus group discussions around the state that the community college "pattern of classroom usage . . . closely parallels the pattern in the State University".[27] That pattern shows a sharp drop in classroom utilization beginning at about 2:00 p.m. on most days, and a very steep drop after 12:00 noon on Fridays. This conclusion is consistent with the views expressed to us by community college personnel.

Attempts to schedule afternoon classes have often been unsuccessful because many students work and cannot stay on campus long enough to take classes during both morning and afternoon hours. Most faculty also prefer to teach in one block of time

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[27]CPEC, 1990a

without the need to stay on campus through most of a day. Some colleges have found, however, that the problem with trying to hold both morning and afternoon classes is that the afternoon classes were treated as a continuation of the morning schedule, making it necessary for students and faculty to be on campus most of the day. By introducing self-contained academic schedules in the afternoons, these colleges have been able to give students and faculty a choice of being on campus for either morning or afternoon courses (i.e., the afternoon schedules resemble the evening programs). Colleges that have experimented with such programs report success in increasing the utilization of their facilities in the afternoons, particularly when the afternoon schedules have concentrated on offering heavily subscribed general education courses. These colleges have found that students often like the added flexibility made possible by afternoon programs. Working students can often adjust their schedules to permit either morning or afternoon attendance; they have difficulty when they must be on campus more than a half-day. Afternoon course schedules emphasize standard-length courses of the kind now usually given during morning sessions, or longer courses given fewer days each week, a practice that is more common in evening programs.[28]

How many additional WSCH could be accommodated if more classes were held from 2:00 - 5:00 in the afternoons? For a college that does not now schedule any classes in that time period, full utilization of those three hours would represent a 28 percent increase in the availability of classroom (and presumably laboratory) contact hour time. The absence of utilization data from the community colleges makes it impossible to know what the actual increase in WSCH might be across the system. However, a simple scenario may yield some insight into the possibilities: Let us assume that one-fourth of the growth in enrollment demand at existing colleges between 1992 and 2005 will come

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[28]At Solano Community College, for example, "instructors . . . find the one-afternoon-a-week class to be a pleasant alternative. The presentation of the class material follows the same format [as] a 3-hour evening offering. Students appreciate the [afternoon] class as it saves costs on babysitters and gasoline, and it gives them larger chunks of time for studying, working, or other activities" (Carole Jarrett, Instructional Resource Specialist, Solano Community College, Letter in response to **Challenge XXI** solicitation of ideas from the field, March 2, 1992).

to colleges that already schedule afternoon classes five days a week. Thus, one-fourth of the new students could not be accommodated through afternoon scheduling, since those colleges are assumed to already have fully scheduled afternoons. Let us assume further that an additional 15 percent of the anticipated growth in enrollment could be accommodated by the remaining colleges without the need to develop an afternoon schedule. That would leave 60 percent of the predicted growth in WSCH at existing colleges that could be accommodated in part by filling afternoon classes. Sixty percent of the predicted WSCH growth at existing campuses and centers comes to approximately 1.9 million WSCH. If the three-hour afternoon time period were fully utilized an average of four out of every five days (excepting all of Fridays, for example), a college would be able to effect a 22 percent increase in contact hour time (80 percent of a 28 percent increase). A 22 percent increase in contact hour time for 1.9 million WSCH would accommodate approximately 428,000 additional WSCH, or about 13 percent of the anticipated growth in WSCH at existing colleges. This would translate to a capital outlay cost savings of approximately $396 million.[29]

Master Course Scheduling

Class scheduling on many community college campuses begins with academic and vocational/technical departments specifying the class schedules they prefer for their faculty. Department-preferred schedules are usually approved at the Division level and finally by the Vice-President for Instruction (or equivalent administrator). This procedure usually yields class schedules that are not optimally convenient for the greatest possible number of students at the college; on these campuses, some space is not used that might otherwise be scheduled to accommodate students' course needs. By way of contrast, some colleges—usually smaller institutions—develop college-wide master schedules that attempt to optimize course availability for their students. Course offerings and class times are arranged in order to optimize course availability, and faculty teaching schedules largely flow from those decisions. Some colleges make sure their counseling

[29]428,000 WSCH at $926 per WSCH.

staff review proposed course schedules to ensure that students with different needs will be well served; others ask students to say what programs interest them and what times of day are most convenient for class attendance. These tasks are considerably easier at small colleges than at large institutions, but computer programs that can assist with scheduling optimization are widely available. These programs can consider simultaneously the classes that need to be offered to accommodate the needs of the largest number of students; the characteristics and availability of college facilities; the skills and availability of faculty; and campus distances between facilities.

Colleges could make fuller use of their facilities if they developed master campus course schedules that were optimally convenient for the greatest possible number of students. Employing transcript analyses, information from enrollment applications and student surveys, and the expert judgment of counselors, colleges could employ computer-based class scheduling to find the optimum fit between student program needs and course availability. The master schedules would be adjusted to take department scheduling requests into account, providing the adjustments did not reduce class availability for students. Colleges could develop these master schedules for a two- to three-year period (adjustments could be made each year as needed) in order to provide students with sufficient information to plan their work and personal calendars around their educational programs.[30]

In the absence of data that compares outcomes at colleges both with and without master course scheduling, it is not possible to estimate the contribution that could be made by such scheduling to college abilities to manage additional WSCH. Nevertheless, it is not only likely that some improvements in capacity would flow from this strategy; more efficient scheduling would also clearly be in the educational and career interests of community college students: If, due to scheduling problems, students are unable to find

[30]Many colleges show in their catalogues the terms when each of their courses will be available, up to two years beyond the current term. While this level of forward course planning is now fairly common, colleges rarely plan actual class schedules in advance, so students will know the actual times when courses can be taken.

the courses they need, they may have to attend college for additional terms in order to complete their courses of study, thereby delaying access for other students and their own transition to employment or additional education.

E. POLICIES TO PROMOTE FULLER USE OF FACILITIES

This Policy Discussion Paper has explored the potential cost savings of year-round operations and self-contained afternoon instructional programs, as part of a broader strategy to deal with the expected growth in enrollment demand. If the colleges were to proceed in the directions suggested by this paper, the policy options discussed below might be considered. In thinking about the desirability of YRO and other practices designed to increase college capacity, many may remark that these strategies contemplate fundamental changes in the way community colleges are used to doing business, and may wonder whether the results would be worth the inevitable disruption, discomfort, and "painful adjustments." The answer to this question, we firmly believe, depends in large part on how much one values the maintenance of an open access community college system in California. In today's economic climate (and almost any economic climate one can reasonably imagine in California through the end of this century), the community colleges will be unable to raise more than a fraction of the four billion dollars that will be needed if enrollment growth is to be accommodated through "business as usual." Unless bold steps are taken to accommodate the projected increase in student enrollment demand without having to resort to massive new capital outlay expenditures, hundreds of thousands of prospective new students—most of them ethnic or language minorities—will simply be shut out of higher education. In short, hard times may require hard choices.

Criteria for Approving New Facilities

Districts requesting COCCC (and state agency) approval of plans to build additional facilities on a college campus must now demonstrate that the college will exceed its WSCH capacity as defined by current state facility utilization standards. While COCCC and state agency approval of district proposals depends on individual circumstances, districts that meet this criterion can generally expect a favorable hearing in Sacramento. As this paper has shown, however, the meaning of "capacity" under current state standards assumes (1) a 35 week instructional year and, (2) no use of classrooms and

teaching laboratories for three hours every day (in practice, in the afternoons), provided that other components of the facility utilization standards are met (e.g., a 66 percent classroom occupancy rate). Thus, current state standards do not require or encourage community colleges to implement year-round operations, self-contained afternoon instructional programs, or master course scheduling in order to increase their capacities before seeking authorization to build new facilities.

State standards governing facility utilization are spelled out in administrative code regulations. The criteria employed by the COCCC for approval of district plans to add facilities to an existing campus are tied closely to these standards; thus, if the standards are not sufficiently demanding, COCCC approval criteria will also fail to encourage colleges to make fuller use of their facilities before proposing campus expansion.

The circumstances discussed above suggest a policy that could be implemented by COCCC without having to re-open a debate among state agencies about the appropriateness of current facility utilization standards: COCCC criteria for approving district proposals to build new facilities on existing college campuses could be decoupled from these standards, and tightened to require colleges to expand their capacities through YRO, self-contained afternoon instructional programs, and master course scheduling before proposing new facilities construction on an existing campus.

Models already exist for the establishment of such criteria as a way to encourage fuller use of existing facilities. Districts that propose to build a *new* campus or center must meet a number of CPEC requirements, developed by that agency under the authority of state legislation.[31] Among its criteria for evaluating district proposals, CPEC includes a requirement that districts "address alternatives" to new sites, including:

[31]See the discussion in Section B, above, on approving new campuses and centers.

> . . . the expansion of existing institutions; the increased utilization of existing institutions, particularly in the afternoons and evenings, and during the summer months; the shared use of existing or new facilities and programs with other postsecondary education institutions; [and] the use of nontraditional modes of instructional delivery, such as "colleges without walls" and distance learning through interactive television and computerized instruction. . .

The COCCC could establish similar criteria for the evaluation of district proposals to construct new facilities on existing campuses; the criteria could go beyond the requirement that districts "address" alternatives to new construction, to require that districts implement YRO and other policies to maximize college capacity before new construction is proposed.[32]

Accountability for Space Utilization

The community colleges provide the COCCC with space inventories—lists of how much space they have in various categories (classrooms, laboratories, etc.)—but make no reports on how their space is actually utilized over the course of the academic year. Without such data, COCCC and CPEC cannot know whether the colleges are making the most efficient use of their available space, or suggest ways in which the colleges could make fuller use of their facilities. Facility utilization reports from the colleges would also provide a data base that COCCC, CPEC, and other state agencies could use to assess the current appropriateness of state facility utilization standards. The COCCC could require districts to make regular facility utilization reports as part of the statewide accountability program that will be implemented in the near future.

* * *

[32]State regulations also require districts proposing to build new campuses or centers to provide an "analysis of alternative delivery systems," including increased utilization of existing district resources (California Code of Regulations, Title 5, Section 55831).

The above analysis suggests that COCCC policies could be used to promote the implementation of year-round operations and other practices that might increase college enrollment capacities. By introducing year-round operations, self-contained afternoon instructional programs, and master course scheduling, colleges might be able to obtain enough additional capacity to accommodate a substantial fraction of the growth in student enrollment expected at existing campuses over the next 13 years. If implementation problems could be overcome, these strategies might save as much as half of the capital outlay expenditures that would otherwise be needed to serve the expected growth in enrollment, and help to ensure that access to California's community colleges remains open to all prospective students.

APPENDIX A

Cost Model for Capital Outlay Expenditures With Year-Round Operations

Model Input Data

Data were taken from October 1991 Department of Finance Demographic Research Unit projections of annual average WSCH by district, computed as the Spring/Fall average.

Model Assumptions

Extrapolation of WSCH Forecast From 2000-01 to 2004-05

DOF projections of WSCH were made through the year 2000-2001; a 113.59 percent increase in WSCH was projected from 1995-96 to 2000-01. In order to extrapolate from 2000-01 to 2004-05 by year, we applied the annual average percent increase for the last five years (1995-1996 to 2000-01). The annual average percent increase from 1995-96 to 2000-01 = (113.59)^(1/5) or 102.58 percent per year. For example, District A has a 2000-01 demand projection of 200,000 WSCH. The demand projection for 2001-02 would be 1.0258 x 200,000 = 205,160 WSCH; for 2002-03 would be 1.0258 x 205,160 = 210,453 WSCH, and so on through 2004-2005.

Increases in District Capacity

Each district was assumed to be at maximum WSCH capacity in 1992-93. The trimester model assumes three terms, with WSCH in each term equivalent to the average Spring/Fall WSCH (i.e., a total of 150 percent of current total Spring and Fall WSCH). The current Spring/Fall WSCH is assumed to be 90 percent of the annual WSCH (subtracting 10 percent for summer school), so the net increase would be 1.5 x .9 = 1.35. Different percent increases in capacity were then simulated for each district, ranging from 135 percent to 112 percent. For example, District A has a 1992-93 capacity of 200,000 WSCH. The district's range of added WSCH capacity realized by moving to year-round operation would be from 270,000 to 224,000 WSCH (1.35 x 200,000 to 1.12 x 200,000).

Unmet Demand

Unmet demand was defined as the amount of 2004-05 demand which could not be accommodated by moving to year-round operations. Since a range of percent increases in capacity were simulated for each district, it was possible to calculate a range of unmet demand for each district corresponding to its assumed increase in WSCH capacity. For example, if District A had a demand projection of 250,000 WSCH, the range of unmet demand would be from 0 to 26,000 WSCH {(270,000 capacity - 250,000 demand) to (224,000 capacity - 250,000 demand)}. The unmet demand was summed across all districts to obtain system-wide unmet demand for each simulation of district increase in capacity.

Treatment of Unmet Demand for Costing

The Chancellor's Office estimates that 75 percent of the projected growth in enrollment would be accommodated at existing campuses, and that the remaining 25 percent would be served by new colleges or centers. DOF projections show that the estimated system-wide 1992-93 capacity is 13,373,400 WSCH. System-wide projected demand by 2004-05 is 17,695,264 WSCH. The net increase in demand is 4,321,864 WSCH. Therefore, 25 percent of this increase—1,080,466 WSCH—would be served by building new facilities which would cost an estimated $1.2 billion. The remaining 3,241,398 WSCH would be accommodated at existing campuses by building facilities which would cost an estimated $3 billion. This cost analysis deals with facility cost savings at **existing** campuses. The cost per WSCH used in the model is $3 billion divided by 3,241,398 = $926 per WSCH.

Model A assumes that all unmet demand would be served by existing campuses up to 3,241,398 WSCH. Any unmet demand above 3,241,398 WSCH would be served by the new campuses and centers. The cost of facilities for unmet demand would be $926 x (unmet demand if unmet demand <= 3,241,398 WSCH), or $3 billion.

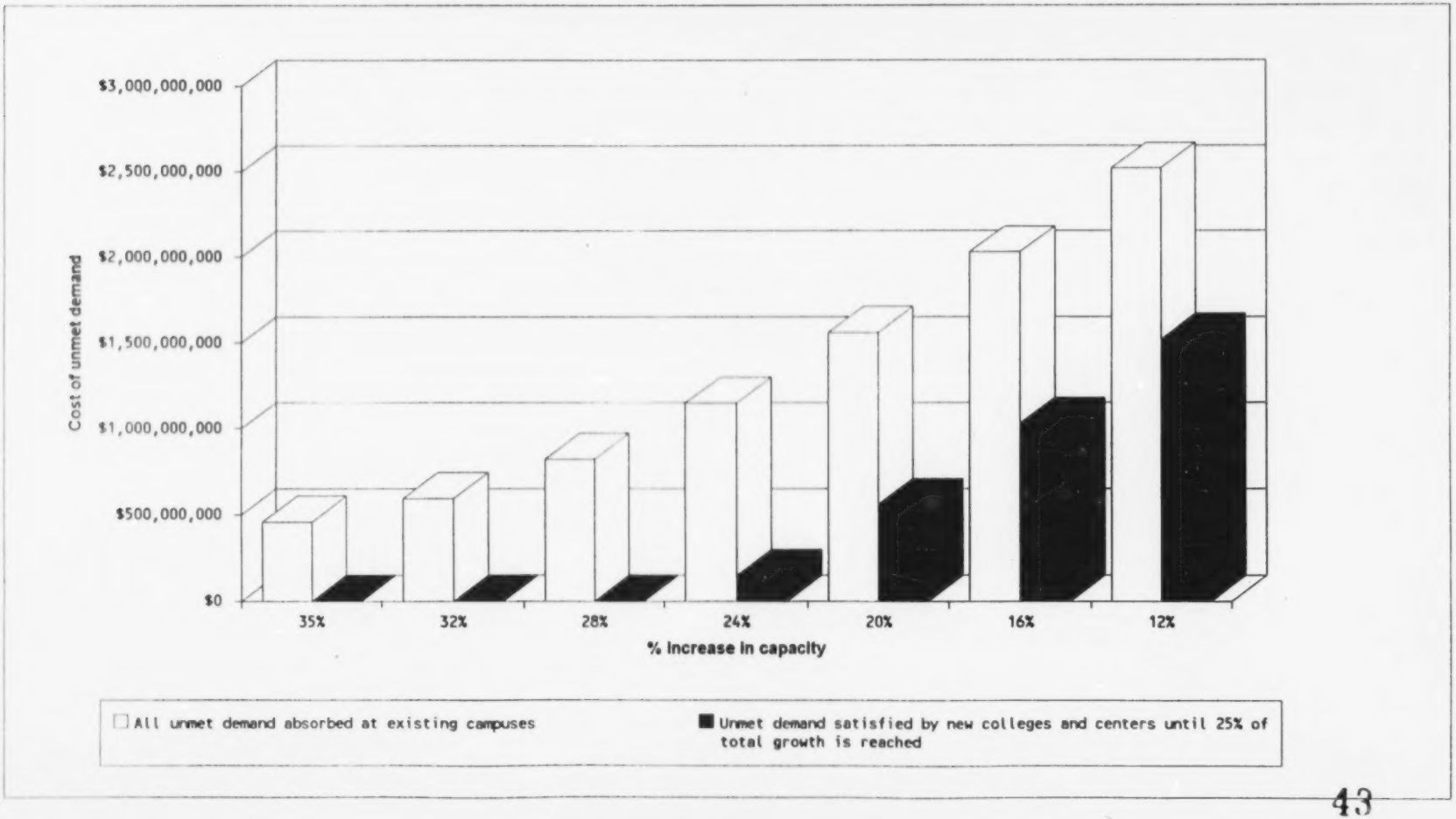
Model B assumes that unmet demand would be satisfied by the new colleges and centers until 25 percent of total growth is reached. The cost of facilities under this scenario would be $926 x (unmet demand - 1,080,466 WSCH) if unmet demand - 1,080,466 WSCH > 0, or $0.

Unmet Demand is absorbed at Existing Campuses

% increase by moving to YRO		35%	32%	28%	24%	20%	16%	12%
Unmet demand with YRO		495,698	640,345	887,283	1,239,936	1,683,693	2,190,700	2,721,056
Facility Cost of unmet demand		$458,781,363	$592,656,347	$821,203,739	$1,147,593,262	$1,558,302,803	$2,027,551,053	$2,518,409,578

Unmet Demand is absorbed at New Campuses

% increase by moving to YRO		35%	32%	28%	24%	20%	16%	12%
Unmet demand		0	0	0	159,470	603,227	1,110,234	1,640,590
Facility cost		$0	$0	$0	$147,593,262	$558,302,803	$1,027,551,053	$1,518,409,578



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District Level (Different YRO %Increase scenarios)

							YRO capacity based on 1992-93							Unmet Demand (Demand 2004-05 minus YRO Capacity)						
	1992-93	2000-01	2001-02	2002-03	2003-04	2004-05	35%	32%	28%	24%	20%	16%	12%	34%	32%	28%	24%	20%	16%	12%
Allan Hancock	108,000	134,600	138,074	141,638	145,294	149,044	145,800	142,560	138,240	133,920	129,600	125,280	120,960	-3,244	-6,484	-10,804	-15,124	-19,444	-23,764	-28,084
Antelope Valley	160,300	166,800	171,105	175,522	180,052	184,699	135,405	132,396	128,384	124,372	120,360	116,348	112,336	-40,294	-52,303	-56,315	-60,327	-64,339	-68,351	-72,363
Barstow	21,800	26,500	27,184	27,886	28,605	29,344	29,430	28,776	27,904	27,032	26,160	25,288	24,416	0	-568	-1,440	-2,312	-3,184	-4,056	-4,928
Butte	135,500	172,100	176,542	181,099	185,773	190,568	182,925	178,860	173,440	168,020	162,600	157,180	151,760	-7,643	-11,708	-17,128	-22,548	-27,968	-33,388	-38,808
Catrillo	135,800	160,200	164,335	168,577	172,928	177,391	183,330	179,256	173,824	168,392	162,960	157,528	152,096	0	0	-3,567	-8,999	-14,431	-19,863	-25,295
Cerritos	191,200	222,700	228,448	234,345	240,393	246,598	258,120	252,384	244,736	237,088	229,440	221,792	214,144	0	0	-1,982	-9,510	-17,158	-24,806	-32,454
Chaffey	149,700	206,400	211,727	217,192	222,798	228,549	202,095	197,604	191,616	185,628	179,640	173,652	167,664	-26,454	-30,945	-36,933	-42,921	-48,909	-54,897	-60,885
Citrus	115,600	130,700	134,073	137,534	141,084	144,725	156,080	152,592	147,968	143,344	138,720	134,096	129,472	0	0	0	-1,381	-6,005	-10,629	-15,253
Coast	485,000	513,500	526,754	540,350	554,297	568,604	627,750	613,800	595,200	576,600	558,000	539,400	520,800	0	0	0	0	-10,804	-29,204	-47,804
Compton	92,700	59,600	61,138	62,716	64,335	65,996	71,145	69,564	67,456	65,348	63,240	61,132	59,024	0	0	0	-648	-2,756	-4,864	-6,972
Contra Costa	407,100	483,000	495,467	508,255	521,374	534,831	548,585	537,372	521,088	504,804	488,520	472,236	455,952	0	0	-13,743	-30,027	-46,311	-62,595	-78,879
Desert	101,100	135,900	139,408	143,006	146,697	150,483	136,485	133,452	129,408	125,364	121,320	117,276	113,232	-13,998	-17,031	-21,075	-25,119	-29,163	-33,207	-37,251
El Camino	245,800	279,000	286,201	293,588	301,166	308,940	331,560	324,192	314,368	304,544	294,720	284,896	275,072	0	0	0	-4,368	-14,220	-24,044	-33,868
Feather River	10,400	12,600	12,925	13,259	13,601	13,952	14,040	13,728	13,312	12,896	12,480	12,064	11,648	0	-224	-640	-1,056	-1,472	-1,888	-2,304
Foothill	436,900	470,400	482,541	494,996	507,773	520,879	589,680	576,576	559,104	541,632	524,160	506,688	489,216	0	0	0	0	0	-14,191	-31,663
Fremont-Newark	91,300	104,800	107,505	110,280	113,126	116,046	123,255	120,516	116,864	113,212	109,560	105,908	102,256	0	0	0	-2,834	-6,486	-10,138	-13,790
Gavilan	58,000	70,300	72,115	73,976	75,885	77,844	78,300	76,560	74,240	71,920	69,600	67,280	64,960	0	-1,284	-3,604	-5,924	-8,244	-10,564	-12,884
Glendale	194,400	201,200	206,393	211,720	217,185	222,791	224,640	219,648	212,992	206,336	199,680	193,024	186,368	0	-3,143	-9,799	-16,455	-23,111	-29,767	-36,423
Grossmont	272,700	263,300	270,096	277,087	284,219	291,555	300,645	293,964	285,056	276,148	267,240	258,332	249,424	0	0	-8,499	-15,407	-24,315	-33,223	-42,131
Hartnell	78,800	95,900	98,375	100,914	103,519	106,191	106,380	104,016	100,864	97,712	94,560	91,408	88,256	0	-2,175	-5,327	-8,479	-11,631	-14,783	-17,935
Imperial	86,300	84,500	86,681	88,918	91,213	93,568	99,505	97,518	94,864	92,212	89,560	86,908	74,256	-4,063	-6,052	-8,704	-11,356	-14,008	-16,660	-19,312
Kern	190,100	242,700	248,964	255,390	261,982	268,744	256,635	250,932	243,328	235,724	228,120	220,516	212,912	-12,108	-17,812	-25,416	-33,020	-40,624	-48,228	-55,832
Lake Tahoe	16,800	22,600	23,183	23,782	24,396	25,025	22,680	22,176	21,504	20,832	20,160	19,488	18,816	-2,345	-2,849	-3,521	-4,193	-4,865	-5,537	-6,209
Lassen	37,200	42,700	43,802	44,933	46,092	47,282	50,220	49,104	47,616	46,128	44,640	43,152	41,664	0	0	0	-1,154	-2,642	-4,130	-5,618
Long Beach	254,800	295,000	302,614	310,425	318,437	326,657	343,980	336,336	326,144	315,952	305,760	295,568	285,376	0	0	-513	-10,705	-20,897	-31,089	-41,281
Los Angeles	1,081,100	1,227,000	1,258,670	1,291,158	1,324,484	1,358,670	1,456,485	1,427,052	1,383,808	1,340,564	1,297,320	1,254,076	1,210,832	0	0	0	-18,106	-61,350	-104,594	-147,838
Los Rios	503,200	637,000	653,442	670,308	687,609	705,357	679,320	664,224	644,096	623,968	603,840	583,712	563,584	-26,037	-41,133	-61,261	-81,389	-101,517	-121,645	-141,773
Marin	114,500	112,200	115,096	118,067	121,114	124,240	154,575	151,140	146,560	141,980	137,400	132,820	128,240	0	0	0	0	0	0	0
Mendocino	32,200	40,000	41,032	42,092	43,178	44,292	43,470	42,504	41,216	39,928	38,640	37,352	36,064	-822	-1,788	-3,076	-4,364	-5,652	-6,940	-8,228
Merced	110,500	152,300	156,231	160,263	164,400	168,643	149,175	145,860	141,440	137,020	132,600	128,180	123,760	-19,468	-22,783	-27,203	-31,623	-36,043	-40,463	-44,883
Mira Costa	108,300	135,900	139,408	143,008	146,697	150,483	143,505	140,316	136,064	131,812	127,560	123,308	119,056	-8,978	-10,167	-14,419	-18,671	-22,923	-27,175	-31,427
Monterey	91,000	104,000	106,684	109,438	112,263	115,160	122,850	120,120	116,480	112,840	109,200	105,560	101,920	0	0	0	-2,320	-5,960	-9,600	-13,240
Mt San Antonio	281,400	342,400	351,238	360,303	369,603	379,143	379,890	371,448	360,192	348,936	337,680	326,424	315,168	0	-7,895	-19,951	-30,207	-41,463	-52,719	-63,975
Mt San Jacinto	59,400	94,300	96,734	99,231	101,792	104,419	80,190	78,408	76,032	73,656	71,280	68,904	66,528	-24,229	-26,011	-28,387	-30,763	-33,139	-35,515	-37,891
Napa	73,300	86,500	88,733	91,023	93,372	95,782	86,955	84,756	93,824	90,892	87,960	85,028	82,096	0	0	-1,959	-4,890	-7,822	-10,754	-13,686
North Orange	439,700	484,500	497,005	509,834	522,993	536,487	583,595	580,404	562,816	545,228	527,640	510,052	492,464	0	0	0	0	-8,852	-26,440	-44,028
Palo Verde	10,700	12,600	12,925	13,259	13,601	13,952	14,445	14,124	13,696	13,268	12,840	12,412	11,984	0	0	-256	-684	-1,112	-1,540	-1,968
Palomar	215,200	290,100	297,588	305,269	313,148	321,231	290,520	284,064	275,456	266,848	258,240	249,632	241,024	-30,711	-37,167	-45,775	-54,383	-62,991	-71,599	-80,207
Pasadena	271,700	307,800	315,745	323,894	332,254	340,830	368,795	358,644	347,776	336,908	326,040	315,172	304,304	0	0	0	-3,922	-14,790	-25,658	-36,526
Peralta	237,800	268,800	275,738	282,855	290,156	297,645	321,030	313,896	304,384	294,872	285,360	275,848	266,336	0	0	0	-2,773	-12,285	-21,797	-31,309
Rancho Santiago	326,700	363,100	372,472	382,086	391,948	402,064	441,045	431,244	418,176	405,108	392,040	378,972	365,904	0	0	0	0	-10,024	-23,092	-36,160
Redwoods	80,700	96,800	99,299	101,861	104,491	107,188	108,945	106,524	103,296	100,068	96,840	93,612	90,384	0	-884	-3,892	-7,120	-10,348	-13,576	-16,804
Rio Hondo	153,500	174,700	179,209	183,835	188,580	193,447	207,225	202,620	196,480	190,340	184,200	178,060	171,920	0	0	0	-3,107	-9,247	-15,387	-21,527
Riverside	214,200	287,200	294,613	302,217	310,018	318,020	289,170	282,744	274,176	265,608	257,040	248,472	239,904	-29,850	-36,276	-43,844	-52,412	-60,980	-69,548	-78,116
Saddleback	282,900	357,200	366,420	375,877	385,578	395,531	381,915	373,428	362,112	350,796	339,480	328,164	316,848	-13,818	-22,103	-33,419	-44,735	-56,051	-67,367	-78,683
San Bernadino	188,700	248,500	254,914	261,494	268,243	275,167	254,745	249,084	241,536	233,988	226,440	218,892	211,344	-20,422	-26,083	-33,631	-41,179	-48,727	-56,275	-63,823
San Diego	577,300	671,800	689,140	706,927	725,174	743,891	779,355	762,036	738,944	715,852	692,760	669,668	646,576	0	0	-4,947	-28,039	-51,131	-74,223	-97,315
San Francisco	523,100	548,800	562,965	577,496	592,402	607,692	708,195	690,492	669,568	648,644	627,720	606,796	585,872	0	0	0	0	0	-896	-21,820
San Joaquin	204,600	269,800	276,764	283,907	291,235	298,752	276,210	270,072	261,888	253,704	245,520	237,336	229,152	-22,542	-28,680	-36,864	-45,048	-53,232	-61,416	-69,600
San Jose	204,500	272,400	279,440	286,671	294,098	301,726	276,075	269,940	261,760	253,580	245,400	237,220	229,040	0	0	0	0	-866	-9,046	-17,226
San Luis Obispo	91,200	120,500	123,610	126,801	130,074	133,431	123,120	120,384	116,736	113,088	109,440	105,792	102,144	-10,311	-13,047	-16,695	-20,343	-23,991	-27,639	-31,287
San Mateo	275,200	298,200	305,897	313,792	321,892	330,200	371,520	363,264	352,256	341,248	330,240	319,232	308,224	0	0	0	0	0	-10,968	-21,976
Santa Barbara	170,400	188,600	193,468	198,462	203,584	208,839	230,040	224,928	218,112	211,296	204,480	197,664	190,848	0	0	0	0	-4,358	-11,175	-17,991
Santa Clarita	67,100	115,000	117,968	121,013	124,137	127,341	90,585	88,572	85,888	83,204	80,520	77,836	75,152	-36,756	-38,769	-41,453	-44,137	-46,821	-49,505	-52,189

Santa Monica	208,900	240,900	247,118	253,496	260,039	266,751	282,015	275,749	267,392	259,036	250,680	242,324	233,968	0	0	0	-7,715	-16,071	-24,427	-32,783
Sequoias	101,400	133,700	137,151	140,691	144,322	148,047	136,990	133,848	129,792	125,736	121,680	117,624	113,568	-11,157	-14,199	-18,255	-22,311	-26,367	-30,423	-34,479
Shasta	103,900	129,800	132,124	135,535	139,033	142,622	140,265	137,148	132,992	128,836	124,680	120,524	116,368	-2,357	-5,474	-9,630	-13,786	-17,942	-22,098	-26,254
Sierra	137,000	184,200	189,954	193,831	198,834	203,967	184,950	180,840	175,360	169,880	164,400	158,920	153,440	-19,017	-23,127	-28,607	-34,087	-39,567	-45,047	-50,527
Siskiyou	31,300	37,300	38,263	39,250	40,263	41,303	42,255	41,316	40,064	38,812	37,560	36,308	35,056	0	0	-1,239	-2,491	-3,743	-4,995	-6,247
Solano	115,400	154,400	158,385	162,473	166,667	170,969	155,780	152,328	147,712	143,096	138,480	133,864	129,248	-15,179	-18,641	-23,257	-27,873	-32,489	-37,105	-41,721
Sonoma	241,100	290,300	297,793	305,479	313,364	321,452	325,485	318,252	308,608	298,964	289,320	279,676	270,032	0	-3,200	-12,844	-22,488	-32,132	-41,776	-51,420
South County	193,800	227,600	233,475	239,501	245,683	252,024	261,630	255,816	248,064	240,312	232,560	224,808	217,056	0	0	-3,960	-11,712	-19,464	-27,216	-34,968
Southwestern	173,100	209,600	215,016	220,560	226,252	232,092	233,685	228,492	221,568	214,644	207,720	200,796	193,872	0	-3,600	-10,524	-17,448	-24,372	-31,296	-38,220
State Center	258,500	341,500	350,314	359,356	368,632	378,147	348,975	341,220	330,880	320,540	310,200	299,860	289,520	-29,172	-36,927	-47,267	-57,607	-67,947	-78,287	-88,627
Ventura	310,400	359,200	368,471	377,982	387,739	397,746	419,040	409,728	397,312	384,896	372,480	360,064	347,648	0	0	-434	-12,850	-25,266	-37,682	-50,098
Victor Valley	85,700	129,500	132,843	136,271	139,789	143,397	115,695	113,124	109,696	106,268	102,840	99,412	95,984	-27,702	-30,273	-33,701	-37,129	-40,557	-43,985	-47,413
West Hills	26,800	32,200	33,031	33,884	34,758	35,655	36,180	35,376	34,304	33,232	32,160	31,088	30,016	0	-279	-1,351	-2,423	-3,495	-4,567	-5,639
West Kern	10,900	13,600	13,951	14,311	14,681	15,059	14,715	14,368	13,952	13,516	13,080	12,644	12,208	-344	-671	-1,107	-1,543	-1,979	-2,415	-2,851
West Valley-Mission	273,700	243,600	249,888	256,337	262,954	269,741	301,995	295,284	286,336	277,388	268,440	259,492	250,544	0	0	0	0	-1,301	-10,249	-19,197
Yosemite	200,000	285,300	272,148	279,172	286,378	293,769	270,000	264,000	256,000	248,000	240,000	232,000	224,000	-23,769	-29,769	-37,769	-45,769	-53,769	-61,769	-69,769
Yuba	104,400	133,700	137,151	140,691	144,322	148,047	140,940	137,808	133,632	129,456	125,280	121,104	116,928	-7,107	-10,239	-14,415	-18,591	-22,767	-26,943	-31,119
Totals	13,373,400	15,980,400	16,392,870	16,815,987	17,250,024	17,695,264	18,054,090	17,652,888	17,117,952	16,583,016	16,048,080	15,513,144	14,978,208	-485,898	-640,345	-987,283	-1,239,936	-1,683,883	-2,190,700	-2,721,056

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APPENDIX B

Challenge XXI Facilities Task Force

Robert Agrella, President, Santa Rosa Junior College
Mike Anker, Faculty, Contra Costa College*
Barbara Benjamin, Faculty, Los Angeles City College
Dale Fleming, Trustee, Marin Community College District
Pete Holman, Director of Vocational Education, Butte College
Fran Jorjorian, Faculty, West Los Angeles College
Guy Lease, Superintendent/President, Lake Tahoe Community College
Dwight Lomayesva, Faculty, Riverside Community College
Leslyn Polk, Adult Education, North Orange Community College District
Jorge Sanchez, Supervisor, Coast Community College District
Jack Scott, Superintendent/President, Pasadena Area Community College District
Octavio Sifuentes, Librarian, Ventura College
William Smith, Trustee, State Center Community College District
Carol Smith, Trustee, MiraCosta Community College District
Jeanette Stirdivant, Counselor, Glendale College
Leo Takeuchi, Dean, Fresno City College
Linda Umbdenstock, Director of Research, Rio Hondo College
Dianne Van Hook, Superintendent/President, Santa Clarita Community College District*
Jim Young, Chancellor, Kern Community College District

*Co-chair

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